IN THE SPECIFICATION

Please replace the paragraph beginning at page 1, line 5 with:

The application is a division of application Ser. No. 10/096,543, originally filed on March. 13, 2002, now U. S. Patent No. 6,686,827, and the disclosure of which is incorporated herein by reference.

Please replace the paragraph beginning at page 8, line 18 with:

As shown in FIG. 2, some parts of the second metal layer 11 are removed from the surface of the double-sided copper foil clad substrate 10 by an etching process to form non-metal areas 15, while the surface of the first metal layer 12 of the double-sided copper foil clad substrate 10 is protected by insulating tape; one then proceeds with a composite electroplating process with carbon black on the surface of the second metal layer 11 of the double-sided copper foil clad substrate 10. The solution for the composite electroplating process contains 40 grams of boric acid, 6 grams carbon black XC-72, and 30 grams of nickel (weight of nickel in nickel sulphamate solution) per 1 liter; temperature for the process is 35°C, current density is $3A/dm^2$, and electroplating time is 5 minutes. The degreasing solvent used in the cathode-degreasing step is made by adding 60 grams of degreasing agent to 1 liter of deionized water, and the concentration of sulfuric acid used for acid rinse is10%. The utilization of carbon black XC-72, produced by Cabot Co. of the U.S.A., contributes to forming a continuous porous composite electroplated layer 17 containing carbon black and metal on the surface of the second metal layer 11. The main constituents of the continuous porous metal-based composite material layer containing carbon black and metal on the

surface of the second metal layer 11 are an electroplated metal, the primary aggregate of the carbon black, and the secondary aggregate of the carbon black. Electroplated metal adheres to the surface of the primary aggregate and the secondary aggregate of carbon black to form a porous structure.

Please replace the paragraph beginning at page 11, line 10 with:

A metal foil, such as a nickel electroplated copper foil, which has been processed with a single face nodular process and has a thickness of 38 μm, is then employed as a third metal layer 22 of the present embodiment. There is already a metallic nodular layer (not shown) with a thickness in the range of 2 μm to 10 μm on the upper surface of the third metal layer 22; its function is to joint with the crystallized polymeric conductive composite material 21 filled with carbon black and contact with the conductive particles of carbon black in the crystallized polymeric conductive composite material 21 filled with carbon black to lower the interfacial resistance. Referring to FIG. 3, the rough face of the third metal layer 22, the surface of the second metal layer 11 of the double-sided copper foil clad substrate 10, and the conductive composite material 21 having PTC characteristics are laminated using the thermal laminating process at 175°C for 10 minutes to form a multi-layer laminated circuit structure 20. The non-metal areas 15 on the double-sided copper foil clad substrate 10 are filled by the conductive composite material 21 having PTC characteristics which is softened and flows due to the heat. The multi-layer laminated circuit structure 20 is then irradiated by Co-60 with a dosage of 20 Mrad to make the polyethylene in the conductivity composite material cross-link so that it has a shape-memory property.

Please replace the paragraph beginning at page 12, line 16 with:

Referring to FIG. 6, except for the positions of the uppermost end electrode 28 and the bottommost end electrode 29 on the surface of the third metal layer_22 and the first metal layer_12 of the multi-layer laminated circuit 20 respectively, all the other areas including the top isolation trench 24 and the bottom isolation trench 25 are coated with an insulating paint to form a top insulating layer 26 and a bottom insulating layer

Please replace the paragraph beginning at page 13, line 20 with:

Referring to FIG. 10, a nickel electroplated copper foil, which has been processed with a single face nodular process and has a thickness of 38 μm ~~in~~ is employed as the uppermost metal electrode 51 and the bottommost metal electrode 52 of the present embodiment. The rough face of the nickel electroplated copper foil, the double-sided copper foil clad substrate 40, a top conductive composite material 53 having PTC characteristics at its top layer, and a bottom conductive composite material 54 having PTC characteristics at its bottom layer are laminated using the thermal laminating process at 175? for 10 minutes to form a multi-layer laminated circuit structure 50. The top non-metal area 45 and the bottom non-metal area 46 of the double-sided copper foil clad substrate 40 are fully filled by the top conductive composite material 53 and the bottom conductive composite material 54 which are softened and flow due to the heat, respectively. The multi-layer laminated circuit structure 50 is then irradiated by Co-60 with a dosage of 20 Mrad to make the polyethylene in the conductive composite materials 53 and 54 cross-link and thus have the shape-memory property.